IN THE SPECIFICATION

Please amend the paragraph beginning at page 10 , line 27, as follows:

Figure 4: Cyclization using bi-modal peptides. (a) Deprotection and cyclisation. Synthesis of bi-modal peptides which have complimentary ligands at their N- and C- termini allows the cyclisation of these peptides in aqueous buffers (i) Ligation. (ii) Deprotection and ligaction. (iii) Cleavage of the cyclic peptide from the base labile handle. Example; The peptides shown are from Table 1 and represent major protective epitopes on PrtR 27 or PrtK39 (SEQ ID NO:4 and SEQ ID NO:5). (a) Ligation. 95% aqueous TFA. Ligation can be monitored by reverse phase analytical HPLC and mass spectrometry. Ligation conditions can be varied to include scavangers commonly used in peptide synthesis and different acidic conditions to enhance the Friedal-Craft alkylation. (b) Deprotection and ligation. The S-acetyl protecting group can removed by aqueous hydroxyamine 0.05 M, pH 7.3. Ligation, 6 M aqueous guanidine hydrochloride and 0.05 M EDTA pH 6.4-6.5 adjusted by 1 M Tris.HC1 under nitrogen. The ligation straegy can also be accomplished on the solid phase. By selecting which ligand to introduce at the N- and C- terminal parallel and anti-parallel cyclic peptides can be synthesised.

C1

Please amend the paragraph beginning at page 11, line 8, as follows:

Figure 5: Synthesis of multivalent multiple antigenic peptides (MAPs) using alternate ligation chemistries (SEQ ID NO:4 and SEQ ID NO:5). By using different ligation strategies a vareity of peptides can be ligated onto a single multiple antigenic peptide. The example shown is of peptides listed in Table 1. (a) Ligation, 95% aqueous TFA. Ligation can be monitored by reverse phase analytical HPLC and mass spectrometry. Deprotection, Aloc can removed by

C2

palladium(0)-catalyzed allyl group transfer to a basic receptor. after purifiction the second peptide can be ligated on to the MAP, (c) 8 M urea and 0.1 M NaH_2PO_4 (pH range 3-4.7).

Please amend the paragraph beginning at page 11, line 18, as follows:

Figure 6: Serum IgG antibody responses assessed by ELISA to Porphyromonas gingivalis PrtR-27 overlapping peptides (SEQ ID NOs:13-24, 33, and 25-32, respectively, from origin). Twenty one PIN-bound peptides were probed with normal mouse sera (■), protective mouse sera (□), normal human serum (▩), patient D24 sera (▨), patient H10 sera (▩) and patient D20 sera (▩). ELISAs were developed as per Example 1.

Substitute the Sequence Listing submitted herewith for the Sequence Listing filed October 2, 2001.

IN THE DRAWINGS

The attached replacement sheets of drawings include changes to Figs. 4, 5 and 6. The replacement sheets, Figs. 1-7, replace the original sheets including Figs. 4, 5 and 6 filed August 31, 2001.

Attachment: Replacement Sheets (Figs. 1-7)